July 12, 2007
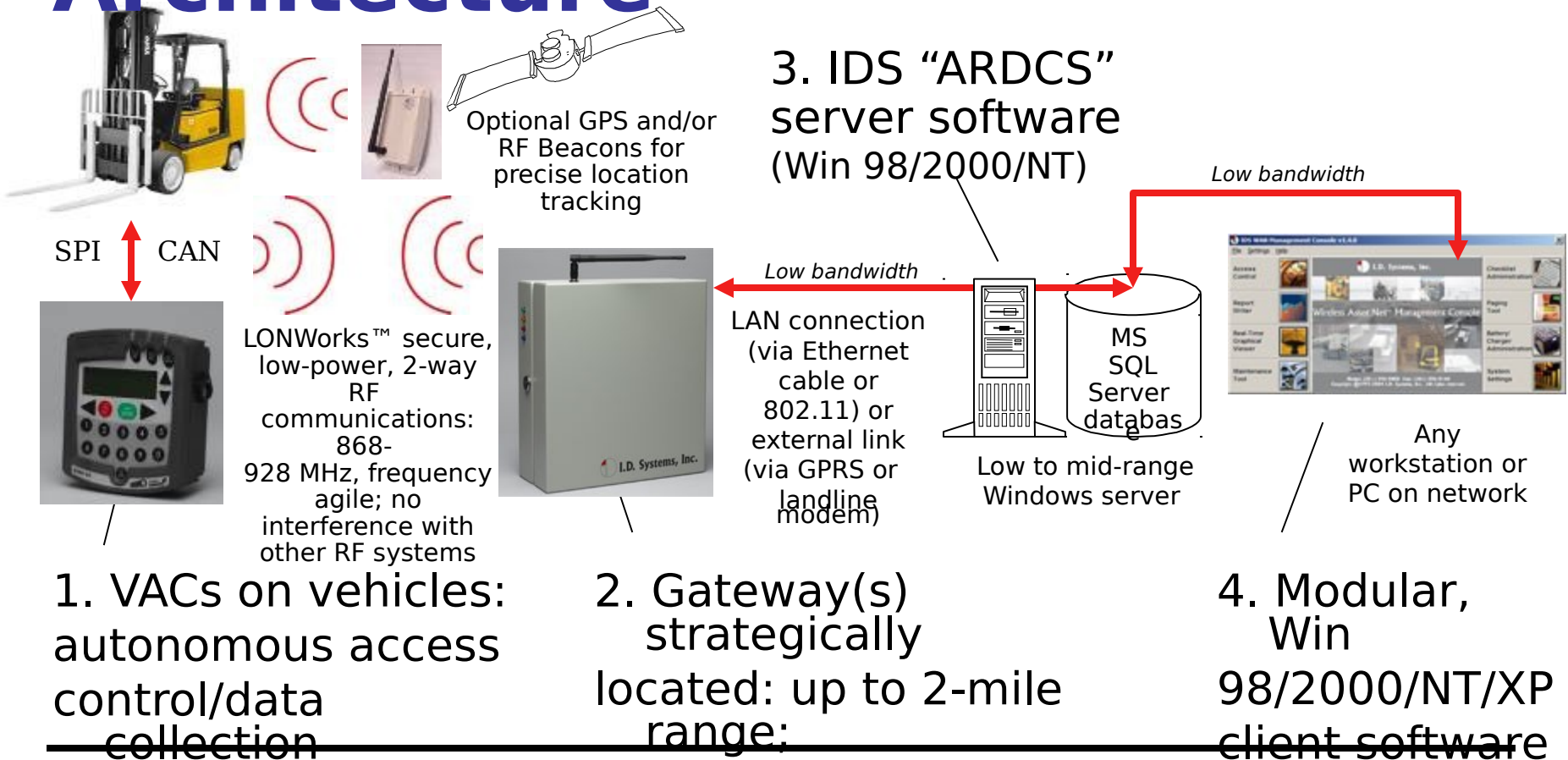
Presenter:

Tom Manzagol

Wireless Access Control & Maintenance Management Of Industrial Equipment

Expanding the Range of Wireless Solutions for
Mobile Equipment Management

IDSY Patented System Architecture

3. IDS "ARDCS" server software (Win 98/2000/NT)

Optional GPS and/or RF Beacons for precise location tracking

Low bandwidth

SPI   CAN

Low bandwidth

LONWorks™ secure, low-power, 2-way RF communications: 868-928 MHz, frequency agile; no interference with other RF systems

LAN connection (via Ethernet cable or 802.11) or external link (via GPRS or landline modem)

MS SQL Server databas

Low to mid-range Windows server

Any workstation or PC on network

1. VACs on vehicles: autonomous access control/data collection

2. Gateway(s) strategically located: up to 2-mile range; no single point of failure

4. Modular, Win 98/2000/NT/XP client software

Expanding the Range of Wireless Solutions for Mobile Equipment Management

Select IDSY Customers

3M

ALCOA

Ford

JOHN DEERE

ADM

AVIS

DAIMLERCHRYSLER

NORTHROP GRUMMAN

RITE AID

Price Chopper

Transportation Security Administration

TOYOTA

WAL★MART

DEPARTMENT OF THE NAVY · UNITED STATES OF AMERICA

TARGET

Walgreens

UNITED STATES POSTAL SERVICE®

Mobile Equipment Management

Equipment Management Issue #1

SAFETY & SECURITY

(bad things happen when untrained or unauthorized personnel use equipment)

Equipment Management Issue #2

MAINTENANCE

(lack of timely data, inefficient planning, and poor control of equipment lead to high maintenance costs & down time)

Expanding the Range of Wireless Solutions for Mobile Equipment Management

Equipment Management Issue #3

UTILIZATION

(excess equipment & underutilized people add up to major capital and operating costs that can be reduced significantly)

Why *Wireless* Management?

- **Paper-based management:** labor-intensive; no access control; no real-time visibility; human error

- **Non-wireless systems**: data collection labor; unreliable access control; no real-time visibility

- **Wireless systems**: <u>proven effective/reliable</u> for access control, real-time data & asset visibility, data accuracy, safety/maintenance/productivity

Expanding the Range of Wireless Solutions for Mobile Equipment Management

Base Wireless System Functions

- Automated, intelligent vehicle access control

- Electronic equipment checklists

- Automated maintenance management, including optional impact sensor

- Automated battery management

- Asset utilization monitoring & analysis

- Real-time vehicle location tracking

- Two-way text dispatching

Expanding the Range of Wireless Solutions for Mobile Equipment Management

Benefits: *Wireless Access Control*

- **OSHA**: ONLY trained operators may use vehicles (100 killed/100,000 injured annually)

- **Operator accountability**: no anonymous abuse

- **Safety**: speed/impact/seatbelt sensing

- **Security**: airport fuel trucks, military MHE, etc.

- **'Monday morning syndrome'**: lost productivity

- **Productivity metrics**: operator as well as vehicle

Latest in Wireless Access Control

- Configurable group-based authorizations

- Onboard database of authorized drivers

- Electronic ID & PIN

- Auto-deactivation

Expanding the Range of Wireless Solutions for Mobile Equipment Management

Benefits: *Wireless Checklists*

- **OSHA regulations**: ensure safe vehicle condition

- **Safety alerts**: automated wireless notification of unsafe conditions

- **"Insurance"**: liability protection against accidents

- **Maintenance**: lock out unsafe equipment; automate PM planning

Latest in Wireless Checklists

- Auto-weighting of response severity

- Event-driven "hierarchical" checklists

- Auto-shutdown

Drive to safe area
Set Parking Brake
Shutdown in 30 secs
OK

Checklist Administration: Complex Checklist

H-Checklists: Electric Forklifts | Add | Delete | Save

Hierarchical Event Trigger List:

Pos	Trigger	Checklist	Data 1	Data
0	ALWAYS	Standard Electric Forklifts		
1	RESPONSE	Headlights Electric Vehicles	Standard Electric Forklifts	Q: Ch
2	IMPACT EVENT	Impact Electric Vehicles		
3	COUNTERS	500 Hour Electric Vehicles	MOTION	Less

Trigger: SPEEDING

Checklist: Operator Speeding

Process the checklist after over speeding is recorded.

1. Count: [1]

☒ Critical Shutdown
☐ Master User Only

Add | Update | Clear Event Triggers

Expanding the Range of Wireless Solutions for
Mobile Equipment Management

Benefits: *Wireless Maintenance*

- **Data collection**: automatic, accurate, multi-point

- **PM scheduling**: variable parameters

- **Damage reduction**: driver accountability

- **Lock-out/tag-out**: automatic and/or manual

- **Visibility**: real-time location tracking/control

- **Battery management**: remote voltage monitoring

- **Configurable sensors**:

Maintenance Data

- Automatic upload & reporting of vehicle motion hours, checklist Warning/Critical issues, impacts

OSHA ID	Date Completed	Employee Name	Veh	Meter Reading	Number	Question	Response	Severity
931	4/6/00 1:48:35 AM	WOODALL, LARRY	007	216	4	10 WT Transmission Oil added in quarts	SERVICE	Critical
931	4/6/00 1:48:35 AM	WOODALL, LARRY	007	216	5	Radiator Water Level?	SERVICE	Critical
931	4/6/00 1:48:35 AM	WOODALL, LARRY	007	216	6	Battery Water Level?	SERVICE	Critical
931	4/6/00 1:48:35 AM	WOODALL, LARRY	007	216	7	Tire Condition?	SERVICE	Warning
931	4/6/00 1:48:35 AM	WOODALL, LARRY	007	216	8	Warning Lights?	SERVICE	Critical
931	4/6/00 1:48:35 AM	WOODALL, LARRY	007	216	9	Fan Belt Tension?	SERVICE	Critical
933	4/6/00 6:01:31 AM	MANION, ROBERT	006	107	18	Radio Reception?	SERVICE	Critical
936	4/6/00 6:14:28 AM	CRUM, TOM	002	222	13	Parking Brake?	LookAtSoon	Warning
936	4/6/00 6:14:28 AM	CRUM, TOM	002	222	19	Removed and Blew out Air Filter?	No	Warning
936	4/6/00 6:14:28 AM	CRUM, TOM	002	222	20	Blew out Radiator?	No	Warning
937	4/6/00 6:17:06 AM	STOVALL, MICHAEL J.	003	116	7	Tire Condition?	Worn	Warning
937	4/6/00 6:17:06 AM	STOVALL, MICHAEL J.	003	116	18	Radio Reception?	Poor	Warning
937	4/6/00 6:17:06 AM	STOVALL, MICHAEL J.	003	116	23	Other mechanical problems?	Minor	Warning

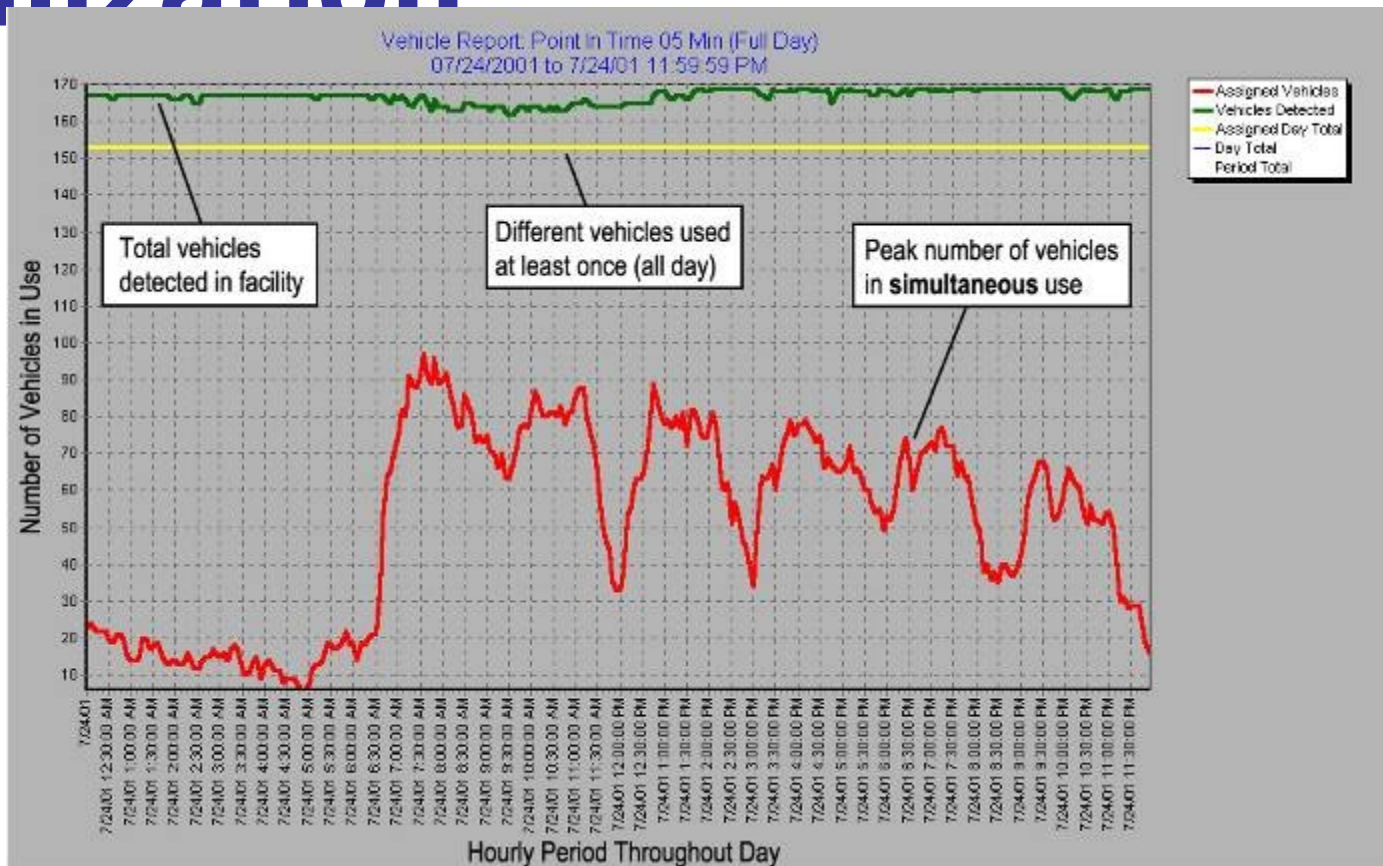- Issue visibility on graphical viewer

Alert/Search Filters

☐ OSHA Overdue	☐ Low Battery detected	☐ Soft Bypassed · ☐ Out-of-Service ▼
☐ OSHA Critical Response	☒ Impact detected	☐ Hard Bypassed · ☐ Assigned ▼
☐ Restricted Zone Violations	☐ Out of Range	☐ Power Down Mode · ☐ Idle ▼

Expanding the Range of Wireless Solutions for
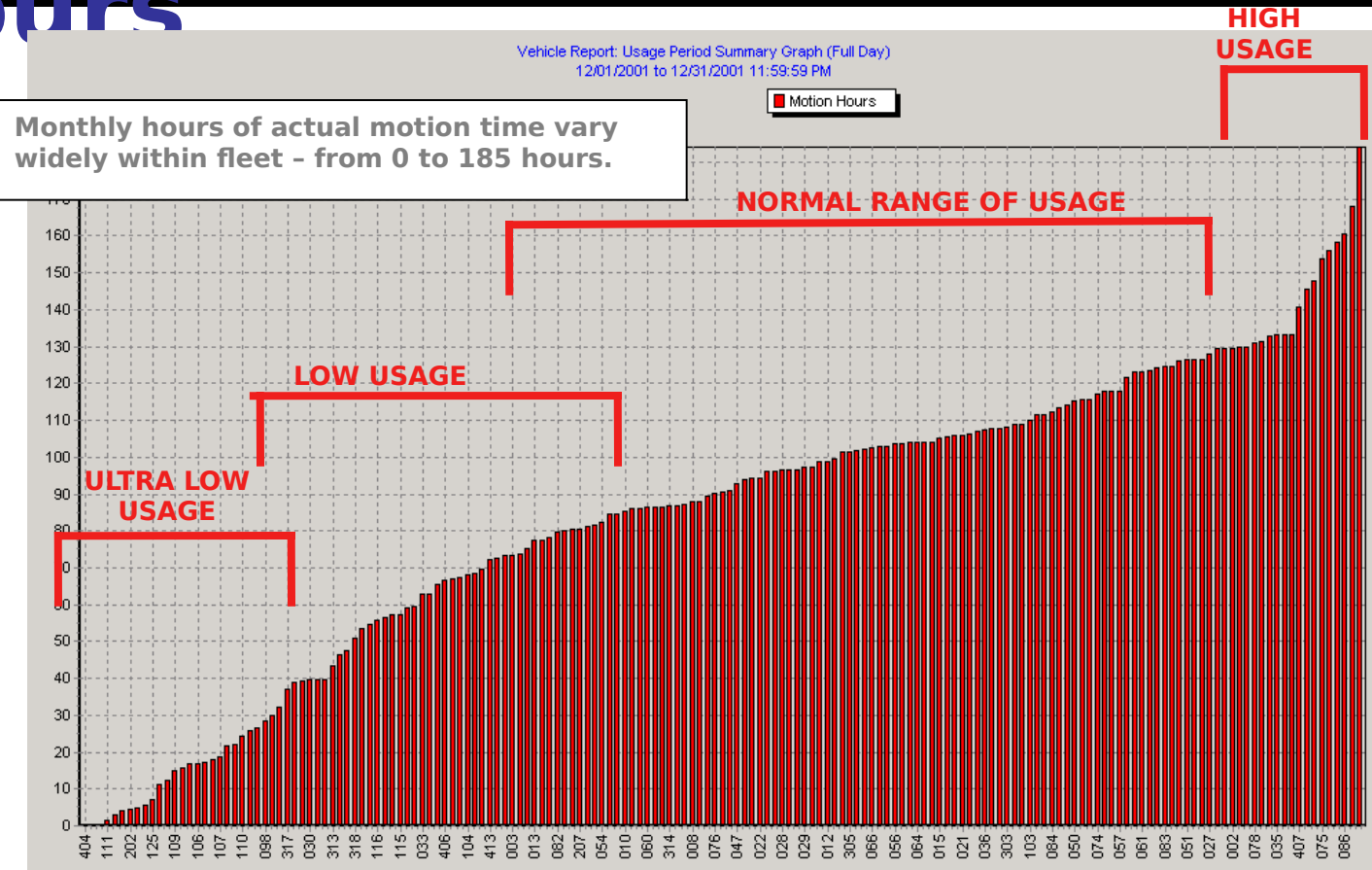Mobile Equipment Management

Maintenance Data: Utilization

Vehicle Report: Point In Time 05 Min (Full Day)
07/24/2001 to 7/24/01 11:59:59 PM

Total vehicles detected in facility

Different vehicles used at least once (all day)

Peak number of vehicles in **simultaneous** use

Expanding the Range of Wireless Solutions for
Mobile Equipment Management

Maintenance Data: Motion Hours

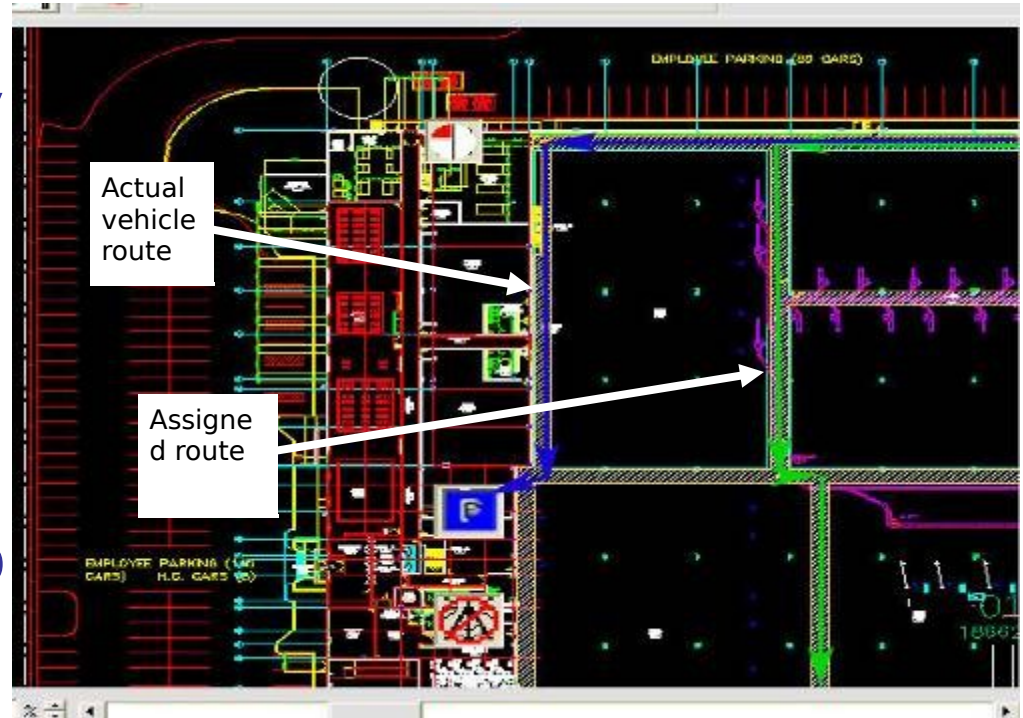Expanding the Range of Wireless Solutions for
Mobile Equipment Management

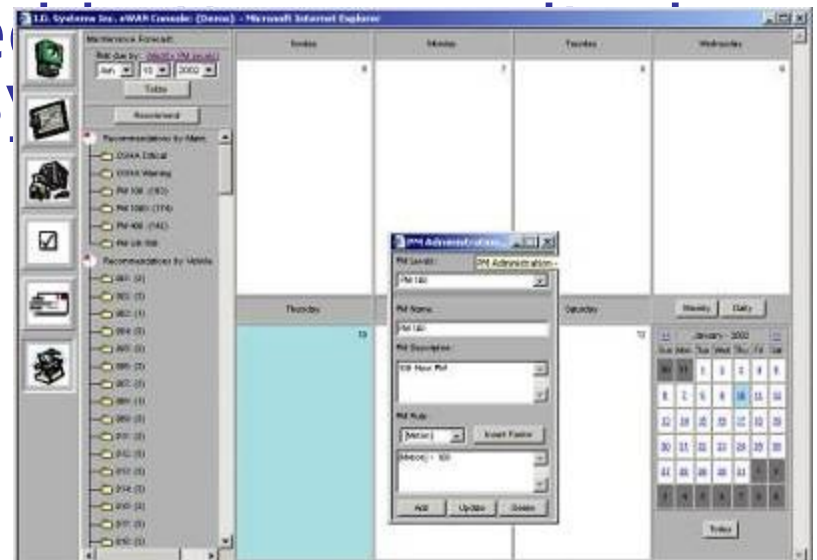# Maintenance Data: Travel Route

- View time-stamped history of travel paths (by vehicle and operator)

- Establish task time benchmarks

- Compare actual to expected routes, durations

Actual vehicle route

Assigned route

Expanding the Range of Wireless Solutions for Mobile Equipment Management

Latest in Wireless Maintenance

- Auto-PM scheduling or data-feed to CMMS
- Auto-vehicle deactivation on definable criteria
- Integration of advanced... ...system
  – swap & for-to-cha...ge sy...

Expanding the Range of Wireless Solutions for
Mobile Equipment Management
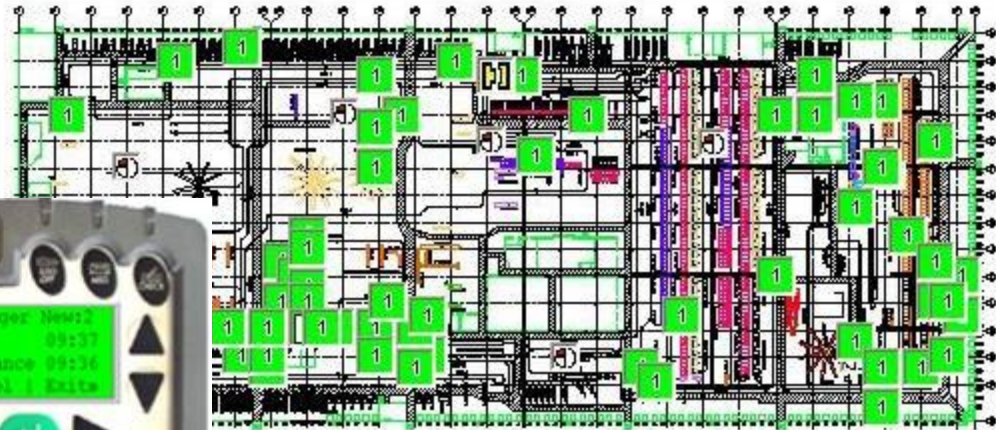
Benefits: *Wireless Fleet Utilization*

- **Data collection**: auto-upload of multiple data points for productivity benchmarking/improvement

- **Unique utilization data**: e.g. simultaneous logins

- **Location tracking**: real-time & historical

- **Two-way text messaging**: dispatch, operator competition & morale building, quality control

Latest in Wireless Utilization Tools

- Automatic event-driven email/pager notification

- Advanced real-time

- Speed/route/load/ deadhead trac

- Advanced
  response
  to text
  dispatch

Expanding the Range of Wireless Solutions for
Mobile Equipment Management

Wireless Options

- **Satellite**: no use under roof; highest cost (ongoing)

- **Cellular**: good coverage but data limitations; battery life & RF energy issues; high cost (ongoing)

- **Wi-Fi RF**: existing infrastructure but no access control/location tracking; WLAN connectivity & security issues

- **Narrow-band RF**: no ongoing cost; good location; low RF energy; WMS compatibility; LAN security; supports autonomous vehicle

Case Brief: *Major National Retailer*

- Corporate-wide roll-out

- Productivity analysis tools measure load weight, speed, distance & deadhead time

- Real-time location tracking provides time-motion analysis and asset protection

- Significant productivity improvements, ROI

Expanding the Range of Wireless Solutions for Mobile Equipment Management

Case Brief: *Regional Food Chain*

- Major DC deployments

- Operator accountability drives significant productivity increases & abuse cost decreases

- 15% reduction in fleet size justified & executed

- 60% ROI

Expanding the Range of Wireless Solutions for Mobile Equipment Management

Case Brief: *F500 Agribusiness*

- Major DC deployments

- Driver login & motion time tracking enforces break times, fosters friendly competition, significantly increases productivity

- Access control, impact sensing, PM planning reduce damage/maintenance costs

- Text messaging used for QC enforcement

- 95% annual ROI

Summary/Conclusions

- Monitor, Measure, Manage uncontrolled physical assets, operators, and operations

- Wireless technology delivering multi-faceted solutions for material handling fleet management

- Compelling ROI proven in all environments (distribution, manufacturing, public/private sectors)

- Rapidly growing market, past "new technology" stage, becoming "best practice"

Expanding the Range of Wireless Solutions for
Mobile Equipment Management

Additional Information

Tom Manzagol: (201) 697-6414

tmanzagol@id-systems.com

I.D. Systems home page: www.id-systems.com

Expanding the Range of Wireless Solutions for
Mobile Equipment Management